

ALESIS

D4

Reference Manual

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CHAPTER 1: INTRODUCTION

Thank you for purchasing the Alesis D4 Drum Sound Module. The D4 provides over 500 high-quality drum/percussion sounds (many of them in stereo), that use the same drum recording expertise responsible for making the SR-16 and HR-16 standards in the music world. And thanks to Dynamic Articulation, which triggers different samples according to velocity, the D4's sounds have a realism and presence that make these sounds stand out in any track or performance.

1.0 PRINCIPAL FEATURES

- **Over 500 Sounds.** Sounds include: 99 kicks, 99 snares, 55 cymbals, 92 toms, 76 percussion sounds, and 80 effects.
- **48 kHz Sample Rate and 20 Hz-20 kHz Bandwidth.** The D4's high sample rate and full bandwidth insure maximum audio clarity from each sound.
- **12 acoustic trigger inputs.** Drummers can trigger D4 sounds with conventional drum pads as well as MIDI pads. Studios can trigger D4 sounds from existing taped drum tracks to replace taped sounds with the D4's high-quality drum sounds. Older drum machines with individual outputs can be revitalized by using them to trigger the D4 sounds instead of triggering the drum machine's internal sounds.
- **Full MIDI implementation.** The D4's master volume responds to MIDI controller 7, allowing for smooth fades and easy changes in overall dynamics, as well as to other important MIDI controllers including pitch bend. Program change commands can call up different Drum Sets.
- **Simultaneous MIDI/trigger operation.** Notes can be triggered by MIDI and/or triggers simultaneously.
- **Trigger to MIDI conversion.** Triggers received by the D4 are converted into MIDI note data that appears at the MIDI Out/Thru connector.
- **Single rack space size.** The D4 fits conveniently into a single rack space.
- **21 programmable drum kits.** Assign different drums to different MIDI notes (or triggers) to create a kit, and recall individual kits with Program Change commands. A footswitch, when pressed, can increment from one drum kit to the next.
- **Multiple outputs.** The D4 offers four outputs, which are arranged as two stereo pairs. Any sound can be sent to either stereo pair (and panned to any of seven positions in the stereo field). However, these can also serve as individual outputs if you pan a single sound hard left or hard right so that it appears over only one output. One possible application is to use one stereo pair for a mix of drum sounds, and the other stereo pair as two individual outputs for specific drum sounds that may need separate processing.

- **Velocity-sensitive Preview button.** Audition sounds at the D4 itself, so you don't have to go back and forth between a controller and the D4 when making drum kit assignments or checking out sounds.
- **Headphone jack.** This is excellent for practicing, or for creating drum kits while other activity is taking place in the studio.
- **Hi hat pedal footswitch.** This lets you incorporate a footswitch to create very realistic hi hat effects.
- **Note chasing.** You can select a note for editing or previewing based on the most recently received MIDI note or trigger input.
- **Drum sound editing.** Vary tuning, mix, and panning, as well as assign drums to "groups" for special effects (such as hi-hat sounds that cut each other off, or cymbals that restrike).

1.1 RETURN YOUR WARRANTY CARD NOW!

Your warranty will be in effect and you will receive product update information only if you send in your warranty card.

1.2 HOOKUP/INSTANT GRATIFICATION

This section describes how to hook up the D4, select Drum Sets, and audition different drum sounds. For more detail on these and other operations, refer to Chapters 2-5.



1.2A Installation

For most applications the D4 should be installed in a rack frame so that you can tap the Preview button without causing the unit to slide around. The D4 generates very little heat so it is not necessary to leave an empty space for ventilation above or below the unit.

1.2B Hook Up Audio (rear panel)

1. Turn down the master volume control of your monitoring system, PA, mixer, instrument amp, etc.
2. Turn down the D4's front panel volume control.
3. Connect the D4's Main stereo outputs to a suitable stereo monitoring system or mixer.
4. The D4's Aux jacks can provide additional outputs for selected drums. To use these optional outputs, patch them into your monitoring system or mixer.
5. To monitor via headphones, plug them into the front panel Phones jack. If you monitor only through headphones, it is not necessary to hook up the Main and/or Aux outputs.

Note: The front panel volume control simultaneously sets the level of the Main, Aux, and Headphone outputs.

1.2C Hook Up MIDI (rear panel)

MIDI commands can trigger the D4's drum sounds, select different Drum Sets, and control the overall level.

1. Connect the MIDI Out from the source of MIDI data (sequencer, MIDI drum pads, trigger-to-MIDI converter, keyboard, etc.) to the D4's rear panel MIDI In.
2. To distribute the MIDI signal present at the D4's MIDI In to other units, connect the D4's MIDI Out/Thru to the other units' MIDI In. MIDI Out has other applications, as described in section 4.2.

1.2D Hook Up External Triggers (rear panel)

The D4's drum sounds can be triggered by non-MIDI electronic drum pads, audio signals from tape, drum sounds from other drum machines, etc.

1. If you're using a hi hat pad, connect its output to rear panel trigger input 1.
2. Connect up to 11 more pads to any of the remaining 11 rear panel trigger inputs.

1.2E Hook Up Power (rear panel)

1. Locate the AC adapter and check that the AC adapter's "INPUT" spec (printed on the adapter label) uses the correct voltage for your part of the planet.
2. Insert the AC adapter's smaller plug into the 9V AC Power jack on the D4's rear panel, and plug the AC adapter itself into a source of AC power. Use only the AC adapter supplied with the D4; use of any other AC adapter will void your warranty.

Note: To prolong the AC adapter's life, unplug it when not in use (turning the D4's power switch to off is not sufficient to disconnect the AC adapter from AC power). Alesis recommends plugging your AC-powered devices into a switched barrier strip, so that turning off the barrier strip turns off power to your gear.

1.2F Turn On Power

1. Turn on the D4's front panel On/Off switch by pushing on it, then turn on your monitoring system. The D4's LCD should light to indicate that power is being received.

Caution: It is always good practice to keep your monitoring system's level all the way down until all units feeding it have been turned on. Although the D4 doesn't make noise on power-up or power-down, other units may not operate in an equally polite manner.

2. Turn up the D4's front panel volume control about halfway. Turn up the monitoring system's volume control to a low level to prevent blasting your amp and speakers. After the D4 starts making sounds, adjust the monitoring system levels for a comfortable listening level.

1.2G Select Drum Sets

1. After turning on power, the LCD will show a sign-on message. If the LCD does not light, check your power connections.
2. Press the Drum Set button; its LED will light. The LCD will show a Drum Set number on the upper line and the Drum Set's name on the lower line (similar to the example below).

DRUMSET 00
"Standard Stuff"

3. Trigger D4 notes via MIDI or acoustic triggers. Different MIDI notes (within the range of 36-96) or triggers should trigger different drum sounds.
4. Turn the Data wheel clockwise to select higher-numbered drum kits or counterclockwise to select lower-numbered drum kits. Each click calls up a Drum Set. You cannot select a Drum Set number lower than 00 or higher than 20.

1.2H Audition Different Drum Sounds

Drum sounds are organized as Banks of individual drum sounds. Available Banks are:

Kik (Kick)
Snr (Snare)
Cym (Cymbals and hi hats)
Tom (Tom toms)
Prc (Percussion)
Efx (Effects)

1. Press the Voice button, and its LED lights. The display shows a MIDI note number on the top line and the name of the currently selected drum sound on the lower line. Here's a typical screen:

NOTE: 038 D1
Snr/ <u>25</u> : Piccolo

This example shows that the sound will be triggered by MIDI note 038, belongs to the Snare (Snr) Bank, is the 25th sound of the snare Bank, and is named Piccolo.

Note that the 25 is underlined. An underline (cursor) indicates that a parameter is available for editing. The cursor may be moved to edit either of the two available parameters in this page. In this case, you could choose a different snare sound with the Data wheel. If the cursor was under Snr, then you could choose a different Bank.

2. Tap the Preview button to hear the sound shown on the LCD. Since this button is velocity-sensitive, harder taps will give a louder sound. If you don't hear anything, and you're tapping the button with sufficient force, check your audio connections and volume levels for your monitoring system and D4.
3. To audition other drum sounds within the selected Bank, check that the cursor is under the drum number. If not, use the cursor buttons to move the cursor under the instrument name parameter in the lower half of the display.
4. Rotate the large Data wheel. Each click of the knob will call up a new drum sound, until you reach either the highest- or lowest-numbered sound within the Bank. Tap the Preview button to hear the selected sound.
5. To audition other banks of sounds, press the left cursor button so that the first character of the Bank name is underlined, as in the following example:

NOTE: 038 D1
Snr/ <u>01</u> : Raw Hide

6. Use the Data knob to change Banks. The drum sound number will reset to 01. To listen to other sounds within the Bank, repeat steps 3 and 4 and tap the Preview button as needed.

1.2I Assign Drum Sounds to Particular MIDI Notes

1. Press the Voice button.
2. Use the cursor buttons to place the cursor under the MIDI note number on the top line.
3. Rotate the Data knob and select the note to which you want to assign a particular drum sound.
4. Select the desired Bank and drum sound as described in section 1.2H, “Audition Different Drum Sounds.”

NOTE: It is important to note that your MIDI controller (keyboard or drum pad controller) must have its MIDI note numbers assigned to the corresponding set of note numbers which you have selected for the D4.

You now know how to select Drum Sets, Banks, and individual sounds, as well as how to assign sounds to MIDI notes. However, there is much more to the D4. The next part describes all of the D4’s editing features in detail. Please read the entire manual at some point to understand the D4’s many capabilities.

1.3 BASICS AND DEFINITIONS

1.3A The Voice

Each time the D4 receives a MIDI or acoustic trigger, it plays a *voice*. A voice is a sound-generating element with several variable parameters: Drum sound, tuning, volume, output assignment (the voice’s audio output can go to either one of two sets of stereo outputs), panning (the voice’s audio output can be positioned at any of the seven positions available within the stereo field of the chosen set of outputs), and MIDI note number.

Each voice is *velocity-sensitive*: the harder you hit a drum pad (or the Preview button) or the higher the velocity value of the MIDI trigger, the louder the drum sound assigned to the pad will play. Thanks to the Dynamic Articulation™ techniques mentioned earlier, the timbre (tonal content) and pitch will often change as well, just like “real” drums.

1.3B About the Edit Buffer

Whenever you select a Drum Set, all parameters associated with the Drum Set load into a temporary memory buffer. As you edit the Drum Set, changes are made to this temporary version rather than the original Drum Set.

This is important for two reasons:

- If you don't like the results of your edit, you can always revert to the original Drum Set.
- If you do like the results of your edit, you must save the buffer's contents. It can overwrite the original Drum Set data, or be written to a different Drum Set.

If you select another Drum Set, the data in the edit buffer will be overwritten with the newly-selected Drum Set's parameters.

1.3C About Defaults

A default is a setting that is automatically assumed until you purposely change it.

Example: When you turn on a VCR, it automatically defaults to Stop—you have to purposely tell the machine to go into Record or Play. Stop is therefore the VCR's power-up default status.

The D4 includes several default settings. *Example:* If you want to save a Drum Set, the D4 will default to saving it to its existing memory slot. However, if desired you can save to another location in memory.

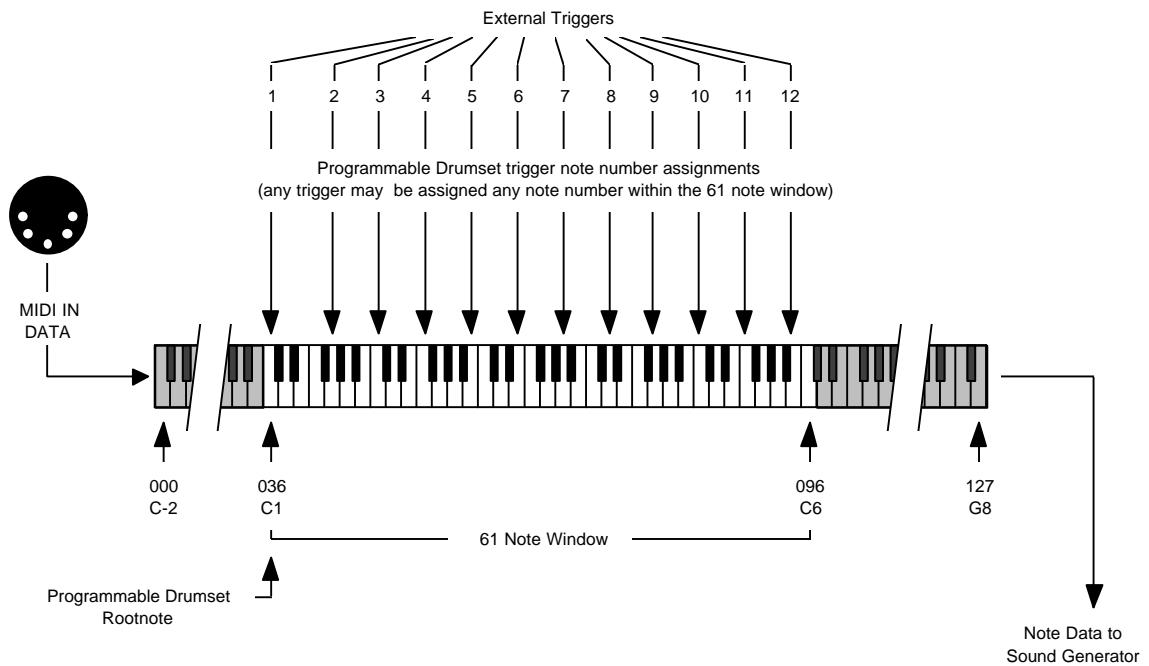
Defaults save time by giving you a setup that's instantly ready to go; sometimes you'll need to change only a few parameters to modify the default setup to your liking.

Often the default is "whatever was selected last." *Example:* If the D4 was set to Drum Set 14 just before you shut off power, upon power-up the D4 will return to Drum Set 14.

1.3D MIDI Note Range

The D4's sounds can be assigned to any note within a 5-octave (61 note) range, from MIDI note 36 to 96. However, this range may be shifted using the Root Note feature (section 4.1). For example, the bottom root note could be shifted to MIDI note 0, in which case the highest note would be five octaves above that, or MIDI note 60. Shifting the root note to the highest possible value, 67, means that the highest note will end up on MIDI note 127.

Alesis D4 Trigger / Note Relationship



1.4 ABOUT THE USER INTERFACE

The D4 is very easy to edit. The various buttons are organized as follows.

Store	Voice	Mix	Power
Volume	Data Wheel	Preview	Note Chase
Headphone Jack	Display	Cursor Buttons	External Trigger
Drum Set	Group		MIDI

1.4A Function Buttons

The eight Function buttons select eight different groups of parameters, as shown on the LCD. Pushing a Function button lights its associated LED and deselects any previously-selected Function button (its LED goes out). The functions are:

Voice Chooses the drum sound to be edited and/or assigned.

Tune Sets the drum sound's tuning.

Mix Sets the drum sound's Volume and Pan parameters.

Output Selects one of the two sets of stereo outputs.

Drum Set Selects one of the 21 Drum Sets.

Ext Trig Determines which trigger inputs will trigger which drums, and sets up trigger input response for the most reliable triggering.

Group Determines how a drum sound (or group of drum sounds) will respond to successive series of triggers.

MIDI Edits D4 MIDI parameters.

1.4B Cursor Buttons

Upon selecting a function, the LCD will show one or more editable parameters. A cursor (underline) will appear under whichever parameter is ready to be edited. You can select a different parameter to be edited by pressing the appropriate cursor button (see next paragraph) until the selected parameter is underlined.

Pressing the > cursor button moves the cursor from left to right, or from the top line to the bottom line. Pressing the < cursor button moves the cursor from right to left, or from the bottom line to the top line.

1.4C Multi-Page Functions

The MIDI and Ext Trig functions have more parameters than can fit on a single screen (the MIDI function has five different screens, Ext Trig also has five). To access different pages within these functions, either:

- Press the Ext Trig or MIDI button to advance to the next page. Upon reaching the last page in the series, further pressing of these buttons “wraps around” to the first page in the series.
- Repeatedly pressing either cursor button will eventually move past all the parameters on the current LCD screen to another LCD screen.

1.4D Editing Parameter Values

After selecting the parameter to be edited, use the Data wheel to vary its value. Once a Drum Set has been edited, a period appears in the display after the Drum Set number. *Example:* This Drum Set has not been edited.



This Drum Set has been edited. Note the period.



The period reminds you that if the Data wheel is rotated and another set selected, any changes made to the current Drum Set will be lost.

1.4E The Store and Note Chase buttons

The Store button saves edited Drum Sets by overwriting existing Drum Set data with the contents of the edit buffer. Note Chase allows a MIDI note or acoustic trigger to choose a particular note (and therefore its assigned drum sound) to be edited.

1.4F The Preview Button

You can tap the velocity-sensitive Preview button at any time to trigger the currently selected sound.

CHAPTER 2: DRUM SET MANAGEMENT

In most cases, you will call up a particular Drum Set when you want to use the D4. Drum Sets can be selected, named, edited, and saved (stored).

2.0 SELECTING DRUM SETS

1. Press the Drum Set function button; its LED will light. The LCD will show a Drum Set number on the upper line and the Drum Set's name on the lower line (similar to the example below).

DRUMSET 00
"Standard Stuff"

2. Turn the Data wheel clockwise to select higher-numbered drum kits or counterclockwise to select lower-numbered drum kits. Each click calls up a Drum Set between 00-20.

2.1 STORING/NAMING AN EDITED DRUM SET

Drum Sets can be edited in many ways (including naming), as described in subsequent sections. As mentioned in section 1.4D, a period after the Drum Set number indicates it has been edited.

To save these edits, the Drum Set must be stored to memory prior to selecting another Drum Set (see section 1.3B for more information on how edited parameters are stored in an edit buffer). To save an edited Drum Set:

1. Press the Store Button. The LCD's top line shows the memory location into which the Drum Set will be saved; the lower line shows the Drum Set name.
2. Use the Data wheel to select the memory location into which the edited Drum Set should be saved (as shown by the cursor). This defaults to the location of the currently-selected Drum Set, but can be changed to any set from 00 to 20.
Important: Saving to a Drum Set overwrites any existing data in that Drum Set.
3. To rename the Drum Set, press the > cursor button. The cursor will jump to the first character of the name. Use the Data wheel to select the desired character. Characters available (in addition to a blank space, Yen symbol, and left and right arrows) are:

!	"	#	\$	%	&	'
()	*	+	,	-	.
/	0	1	2	3	4	5
6	7	8	9	:	;	<
=	>	?	@	A	B	C
D	E	F	G	H	I	J
K	L	M	N	O	P	Q

R	S	T	U	V	W	X
Y	Z	[]	^	-	'
a	b	c	d	e	f	g
h	i	j	k	l	m	n
o	p	q	r	s	t	u
v	w	x	y	z	{	
}						

4. After naming the Drum Set and selecting where it should be stored, press the Store button again. The LCD will briefly show DRUMSET STORED to confirm that it has been stored. The Store LED will then go out and the D4 will return to the mode it was in prior to the Store button being pressed.

Note: If you change your mind and want to cancel the storage process, press any of the eight Function buttons before pressing Store a second time. Your edits will remain intact until you select another Drum Set.

2.2 RECALLING FACTORY DRUM SETS

The D4 includes 21 factory-programmed Drum Sets that are useful in a wide range of applications. To recall one of the factory Drum Sets:

1. Press and hold the Drum Set function button. While holding this button, press the Store button. Release both buttons. The display shows something like:

RECALL ALESIS
SET 01 INTO 01

2. The cursor will be under the Drum Set to be recalled. Use the Data wheel to select the desired Drum Set. As soon as you select a Drum Set, it will be loaded into the edit buffer (and overwrite any existing edit buffer data—careful!) so you can play some notes and make sure it's the right set.
3. Press the > cursor button to select the destination Drum Set number for the recalled Drum Set.
4. Use the Data wheel to select the desired destination memory slot. To recall *all* of the original factory Drum Sets, press the > cursor button one more time.
5. To complete the operation, press the Store button. The display will confirm that whatever you selected has been stored.

If you change your mind and want to cancel the recall process, press any of the eight Function buttons before pressing Store a second time.

Note: Remember that recalling a Drum Set overwrites the edit buffer contents. If you cancel the recall operation by pressing one of the eight Function buttons, any Drum Set you recalled will remain in the edit buffer but Drum Sets 00-20 will remain unchanged. This can be useful for auditioning the various preset Drum Sets.

Also note that if you are concerned about overwriting data you want to keep, save the D4's memory first, as described in section 4.6.

CHAPTER 3: FUNCTION BUTTONS

The function buttons allow you to edit Drum Set parameters on a fairly detailed level.

3.0 NOTE CHASE/DRUM NOTE SELECTION

The Voice, Tune, Mix, Output, and Group buttons all require selecting a particular drum note for editing. The top line of each of these screens shows the note that is being edited. For example, the Voice selection screen shows:

NOTE: 054 F#2
Kik/01: Big "O"

There are two ways to select the drum sound to be edited or previewed:

- Place the cursor under the note and turn the Data wheel to select a different note.
- The D4 has a function called Note Chase. When this button is enabled, an incoming MIDI note or trigger will select the note to be edited. This makes it easy to change the same parameter for all drums; call up the editing function (voice, tune, mix, etc.) and select various drums by playing their associated keys. The display will read out the note name and MIDI number.

Note Chase can also be used as a piece of “MIDI test equipment” to determine the note number of an incoming MIDI note. This will only happen if the sending device is on the same MIDI channel as the D4 and if the sending note is within the note range of the currently selected drum kit. Also, whenever the D4 receives a signal to play one of its sounds (via either trigger or MIDI input) the Note Chase LED will flash.

3.1 VOICE

Press Voice, and the LCD shows the selected MIDI note number on the top line and two parameters, drum Bank and Drum Sound, on the bottom line. *Example:*

NOTE: 054 F#2
Kik/01: Big "O"

To select a drum Bank, place the cursor under the drum Bank name and turn the Data wheel. Bank options are:

Kik (Kick)
Snr (Snare)
Cym (Cymbals and hi hats)
Tom (Tom toms)
Prc (Percussion)
Efx (Effects)

To select a drum sound within the Bank, place the cursor under the drum sound and turn the Data wheel. The accompanying chart included with the D4 shows the names of all available drum sounds.

3.2 TUNE

Press Tune, and the LCD shows the selected MIDI note number on the top line and the Pitch on the bottom line. *Example:*

NOTE: 054 F#2
PITCH: +0.00

To change the pitch one semitone at a time, place the cursor under the units (leftmost) digit and turn the Data wheel. To change the pitch one cent at a time, place the cursor under the tens (middle) digit and turn the Data wheel. The range is from +3.00 (most sharp) to 0 (normal pitch) to -4.00 (most flat).

3.3 MIX

Press Mix, and the LCD shows the selected MIDI note number on the top line and two parameters, Volume and Pan, on the bottom line. *Example:*

NOTE: 054 F#2
VOL: 90 PAN <>

To change the Volume, place the cursor under the Vol value and turn the Data wheel. Values are variable from 00 to 99.

The D4 has two pairs of stereo outputs. Drum sounds can be assigned to either pair of outputs as described in section 3.4, and placed anywhere within the stereo field of the assigned outputs via the pan function.

To change a drum's panning (position in the stereo field), place the cursor under the Pan value and turn the Data wheel. The seven available pan positions correspond to the number shown in parentheses: hard left (1), soft left (2), left of center (3), center (4), right of center (5), soft right (6), and hard right (7).

Note: When heard from the drummer's perspective, the high-hat will usually be on the left, snare and kick in the center, and toms trailing from left-center to right. Of course, one of the advantages of electronic drum sets is that you need not follow any standard way of placing drum sounds in the stereo field.

3.4 OUTPUT

Press Output, and the LCD shows the selected MIDI note number on the top line and the drum's Output assignment on the bottom line. *Example:*

NOTE: 054 F#2
OUTPUT: MAIN

To change the output assignment, turn the Data wheel. To send the drum sound to the Main outputs, select Main. To send the drum sound to the Aux outputs, select Aux.

Having two stereo output pairs allows for several options.

Stereo with Fixed Placement: Plug the left Main output into the left channel of your amp (or mixer), and the right Main output into the right channel. The default voice mix for the preset Drum Sets pans the drums between the Main output jacks in a way that works well for most applications.

Stereo with Variable Placement: Plug the left Main output into the left channel of your amp (or mixer), and the right Main output into the right channel. Pan the Drum Set drums between the Main output jacks as desired.

Stereo with Individual Outputs: This requires a stereo mixer with at least four channels, and provides individual outputs for any two drum voices. Plug the left Main out into a mixer channel panned fully to the left. Plug the right Main out into a mixer channel panned fully to the right. Plug the left Aux output into a third channel (panned to center for now) and the right Aux output into a fourth channel (also panned to center for now). Decide which two voices should be individual voices, such as kick and snare; assign these to the Aux outputs, and all other drums (panned as desired) to the Main outputs.

Pan the kick full left and the snare full right. Thus, the kick will appear in the left aux output, and the snare will appear in the right aux output. These outputs can feed different signal processors and then be sent to a mixing board. Make sure that the drums selected for individual outputs are panned to the extreme left or right in the D4. Otherwise, some of the sound from one drum will leak into the other output.

Separate Percussion/Drum Outputs: Standard drum kit sounds can be spread in stereo and assigned to the main outputs, with percussion sounds spread in stereo and assigned to the Aux outputs. Run the outputs to a mixing console, and you can treat the drum kit and percussion sounds as two submixes. This technique might also be useful if you're recording the part on tape; feed the drums to two tape tracks, and the percussion to two other tracks. Adjust the balance between the two in the mix, or fade the percussion in and out independently of the trap drum sounds. Or, process the two groups individually.

3.5 DRUM SET

Press Drum Set, and the LCD shows the selected Drum Set number on the top line and the Drum Set's name on the bottom line. *Example:*

DRUMSET 00
"Standard Stuff"

To select a particular Drum Set, turn the Data wheel. Numbers range from 00 to 20.

Drum Set selection and management was already covered in more detail in Chapter 2.

3.6 EXT TRIG

Press Ext Trig, and the LCD shows the Trigger input and Trigger Characteristics (Type) on the top line, and the note associated with the Trigger on the bottom line.

Example:

TRIG: 01 TYPE: 01
NOTE: 050 D2

External triggering is a somewhat complex topic and is described in detail in Chapter 5.

3.7 GROUP BUTTON

Press Group, and the LCD shows the selected MIDI note number on the top line and drum's Mode on the bottom line. *Example:*

NOTE: 054 F#2
MODE: MULTI

To change the mode, turn the Data wheel. There are four options:

Multi: When triggering a note repeatedly, each trigger will cause the sound to go through its entire decay. This is useful with cymbals, since early strikes continue to decay as you play later strikes.

Single: When triggering a note repeatedly, a new hit will automatically terminate any sound that is still decaying. This is useful with many percussion sounds (such as tambourine, agogo, etc.).

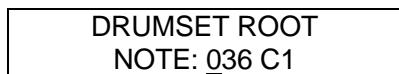
Group 1 and 2: A newly-triggered voice assigned to a particular group (1 or 2) will cut off a voice assigned to the same group if the older voice is still sustaining. The classic use of this is with hi-hats; a closed high-hat will cut off an open hi-hat, and hitting an open hi-hat sound will cut off a closed hi-hat.

The D4 can play up to 16 voices at a time, so it's possible to run out of voices if you play a flurry of notes and have lots of drum sounds assigned to Multi mode. If 16 sounds are playing and you ask the D4 to play another one, the sound that's closest to finishing its decay cycle will be "stolen" so that the most recent sound can be played. In practice, it's difficult (and usually not artistically desirable!) to create drum parts so complex that voice-stealing becomes a problem. However, if this is a

problem, try assigning all the toms to a group so that they only use up one voice at a time.

3.8 MIDI BUTTON

Press MIDI, and the LCD shows the root note for the selected drumset on the bottom line. *Example:*



MIDI options are spread over five different screen displays, which are described in detail in Chapter 4.

3.9 COPYING A NOTE'S PARAMETERS TO ANOTHER NOTE

After editing a note's Voice, Tune, Mix, Output, and Group parameters, you may wish to copy these settings to another note number. This can be useful for setting up chromatic tunings for adjacent keys.

1. Press and hold the Note Chase function button. While holding this button, press the Store button. Release both buttons. The Store LED will light and the display shows something like:

COPY 036 C1
TO 042 F#1

2. The cursor will be under the destination note number. Use the Data wheel to select the note.
5. To complete the operation, press the Store button. The display will confirm that the source note's settings have been stored to the destination note. To copy the source note's setting to additional destination notes, simply repeat steps 2 and 3 until finished.

NOTE: this function only affects the drum set data in the edit buffer. In order to make these changes permanent, you must store the drumset as described in section 2.1.

CHAPTER 4: MIDI FUNCTIONS

This function contains five pages of parameters. When you first press the MIDI button, it calls up the first page. Pressing the MIDI button again calls the second page, pressing it again calls the third page, and so on. If the fifth page is showing and you press the MIDI button again, it will revert to the first page.

Remember that you can also use the cursor buttons to go from one page to another by “cursoring past” the parameters on the current screen. For more details, see sections 1.4B and 1.4C.

In the rest of this section, we'll assume you know how to select the appropriate page.

4.0 DRUM SET ROOT NOTE

1. The first page is the Drum Set Root Note screen, which says:

DRUMSET ROOT
NOTE: 036 C1

This sets the lowest note in the “window” of 61 consecutive MIDI notes, from MIDI note number 36 to 96, to which the D4 will respond; when the root note is altered, all drum note and trigger assignments move in parallel. *Example:* If the root note is changed from 36 to 35, then all notes will be triggered by a note one value lower than the existing assignment—e.g., what was triggered by note 96 will now be triggered by note 95, what was triggered by note 72 will now be triggered by note 71, etc.

Unlike other MIDI parameters, this value (0-67) is stored as part of a Drum Set and can be different for each Drum Set.

2. Turn the Data wheel to select the desired Drum Set root note.

4.1 MIDI CHANNEL SELECTION

The D4 can receive and transmit MIDI data in Omni mode (receives data appearing on any of the 16 MIDI channels, transmits data over channel 1) or Poly mode (transmits and receives over any one of the 16 MIDI channels).

Use Omni when playing the D4 from an external MIDI controller (MIDI drum pads, MIDI keyboard, etc.) since it's not necessary to match channels. When several instruments are being driven by MIDI (e.g., when a sequencer sends out data over several channels to different instruments), use Poly mode so that the D4 tunes in to only the channel containing drum data.

1. The top line of the second page shows the channel status. *Example:*

CHANNEL: <u>OMNI</u>
THRU: OFF

2. Make sure the cursor is set under the channel status.
3. Turn the Data wheel to select Omni or one of the 16 channels (selecting a single channel automatically puts the D4 in Poly mode).

4.2 MIDI THRU/OUT SELECTION

When on, this function passes data appearing at the MIDI In to the MIDI Out/Thru jack as well as to the D4's internal circuitry. This input data is merged with any data being generated by the D4. *Example:* If the D4 is being used for trigger-to-MIDI conversion and Thru is on, the notes generated by the triggers will be merged with the data appearing at the MIDI In jack.

When off, the MIDI Out/Thru jack serves as a MIDI Out only from the D4. Input data present at the D4's MIDI In is not passed through.

1. The bottom line of the second page shows the Thru status. *Example:*

CHANNEL: OMNI
THRU: <u>OFF</u>

2. Place the cursor under the Thru status.
3. Turn the Data wheel to select Off (Out/Thru acts as a MIDI Out jack) or On (Out/Thru acts as a MIDI Thru jack).

4.3 PROGRAM CHANGE ENABLE

Program Change commands can change Drum Sets at any time, including while the D4 is playing. A Program Change Table (section 4.5) determines which Drum Set will be called up in response to a particular Program Change number. The default is Program Changes 00-20 call up Drum Sets 00-20; so do Program Changes 21-41, 42-62, 63-83, 84-104, and 105 to 125. 126 calls up Drum Set 00, and 127 calls up Drum Set 01.

Caution: Some MIDI devices number Program Changes as 1-128, others as 0-127, and some as banks of programs. Use the Program Change Table to compensate for these differences.

1. The top line of the third page shows the Program Change status. *Example:*



2. Make sure the cursor is under the Program Change status.
3. Use the Data wheel to select a status of On (the D4 selects Drum Sets when it receives Program Change commands) or Off (the D4 ignores Program Change commands). Note that even with status set to On, you can still select Drum Sets manually at any time.

4.4 CONTROLLER ENABLE

The D4 can respond to several standardized MIDI controllers appearing at the D4's MIDI In jack:

- 6 **Data Slider (0-127)** This allows an external data slider assigned to controller 6 to vary values, just as if you were using the Data wheel.
- 7 **Main Volume (0-127)** Controller 7 messages set the D4's master volume. Note that this is independent of velocity settings. With many D4 sounds, velocity affects the sound's timbre, so lowering velocity to change the level may affect the timbre. Controller 7 messages alter the overall volume of the entire kit without affecting any sound's timbre.
- 96 **Data Increment (0 or 127)** Send any value for this controller and the currently-selected parameter's value will increment by one.
- 97 **Data Decrement (0 or 127)** Send any value for this controller and the currently-selected parameter's value will decrement by one.
- 98 **Non-Registered Parameter MSB (0-127)** This allows for remote control editing of virtually all parameters via continuous controller messages. The controller value selects the parameter to be edited. The data entry slider can then change the parameter's value. The controller/data slider messages can be recorded into a sequencer to allow for complex, sequenced parameter control.

99 **Non-Registered Parameter LSB (0-127)** This works similarly to controller 98 but the controller value selects the Least Significant Byte of the parameter to be controlled.

121 **Reset All Controllers (0)** Any value sent for this controller resets volume to maximum, pitch bend to zero, and restores all non-registered parameters to their default values.

PB **Pitch Bend** Sending a pitch bend command prior to triggering a note or group of notes will change the pitch of the notes being triggered. Pitch bend messages sent while a drum sound is playing have no effect on the sound. The amount of pitch bend range depends on the sound you've called up, and can deviate by more than the amount allowed by the tuning function.

1. The bottom line of the third page shows the Controllers status. *Example:*

PROG CHANGE: ON
CONTROLLERS: ON

2. Make sure the cursor is under the Controllers status.

3. Use the Data wheel to select a status of On (the D4 responds to controller messages) or Off (the D4 ignores controller messages).

4.5 PROGRAM CHANGE TABLE

1. The fourth MIDI page shows the Program Table. *Example:*

PROGRAM TABLE
<u>000</u> = 00

The lower left, three-digit number represents the incoming Program Change number. The lower right, two-digit number represents the D4 Drum Set that will be selected in response to the displayed Program Change number.

To edit the Program Change table:

1. Place the cursor under the incoming (left) MIDI Program Change number.
2. Use the Data wheel to select the desired Program Change number.
3. Press the > cursor button to move the cursor under the D4 Drum Set number (right).
4. Use the Data wheel to select the desired Drum Set to be called up in response to the specified Program Change number.
5. Repeat steps 1-4 until the table is edited as desired.

4.6 SAVE DATA VIA MIDI

The D4's memory requires power to save data, so when the power switch is off, the memory's contents are normally backed up with an internal battery. However, **it is vitally important to back up what's in the D4's memory!** A mechanical problem (surge on the power line, a quick zap of static electricity) or operator error could alter the data in memory. *Save your data whenever you've done enough work on something that you wouldn't want to lose that work.* If possible, make two backups, and store the second backup in a different physical location from the primary backup.

The D4 converts its program data into a special type of MIDI data, called System Exclusive or sys ex data, that can be sent over MIDI. This data can go to another D4 or to a MIDI system exclusive storage device, such as the Alesis DataDisk, a computer running System Exclusive storage software, or a musical instrument capable of recording System Exclusive data. Either way, your data is backed up.

To allow for running several D4s in the same MIDI setup, System Exclusive data is channelized. In other words, if you save the data over channel 1 to a DataDisk, when you read back data from the DataDisk the D4 must be set to channel 1 (or Omni,

which receives all channels) to retrieve this data. It's a good idea to include the channel assignment in the System Exclusive file name to prevent possible confusion.

To back up:

1. Connect the D4's MIDI Out to the MIDI In of the other D4 or system exclusive storage device, such as the DataDisk.
2. Select the fifth MIDI page, Sysex Backup. With the Sysex Backup page selected, the Store LED will light.
3. Use the Data wheel to call up one of the four available types of data for backup (figures in parenthesis give the approximate amount of memory required by each type):

Edit Buffer data (500 bytes)

Trigger Setup data (50 bytes)

Program Table data (150 bytes)

System (All) data, which includes Drum Sets, trigger setup, program table, and MIDI assignments (8Kbytes)

4. Press the Store button. The display will say **SENDING SYSEX DATA OUT MIDI..** to confirm that data is being sent. The sys ex receiving device should indicate that it is receiving data.

After the transfer is complete, the D4's LCD reverts to the Sysex Backup page.

Note: The MIDI Thru function is disabled while Sys Ex is being transmitted.

4.6A Save to DataDisk

Here's an example of how to save D4 MIDI data to the Alesis DataDisk.

1. Connect the D4 MIDI Out to the DataDisk (DD) MIDI In.
2. Insert a formatted disk into the DD. If the disk is not formatted, insert it in the drive and press the DD Format switch. When the DD display says FORMAT DISK?, press DO/YES. When the display says ARE YOU SURE? press DO/YES again.
3. Press the DD Receive button. The display says RECV ONE SYSEX: WAITING FOR DATA.
4. Press the D4 MIDI button (if you are not already in the MIDI function) and select the Sysex Backup page.
5. Select the type of data to be saved (System, Edit Buffer, Trigger Setup, Program Table).

6. Press the D4 Store button. The D4 display says SENDING SYSEX DATA OUT MIDI... and the DD display says RECEIVING Alesis D4 to indicate that data has been received.
7. To prevent future confusion, name the DD file using the DD NAME function.

4.7 RECEIVE DATA FROM ANOTHER MIDI DEVICE

The D4 will automatically load D4 system exclusive data present at its MIDI In. Therefore, there is no associated function since reception can occur at any time that a sys ex storage device or another D4 sends data through its MIDI Out into the D4's MIDI In.

The D4 is compatible only with D4 system exclusive data; for example, you cannot load system exclusive data from another drum device into the D4.

The following describes how to load data from the Alesis DataDisk; other system exclusive storage devices work similarly, but please refer to the owner's manual for your particular device to find out how to set it up to send MIDI sys ex data.

Note: When loading the Edit Buffer via sys ex, be sure and save the Drum Set before changing to another Drum Set. Otherwise, the data will be lost.

4.7A Load from DataDisk

1. Connect the DD MIDI Out to the D4 MIDI In
2. Insert the disk into the DD that contains the file to be loaded into the D4.
3. Press the DD SEND button. The display says SEND FILE Alesis D4 (filename)?
4. Press the DD DO/YES button. The D4 automatically senses the presence of this data; no button-pushing is required. The DD display says SENDING: Alesis D4 (filename), the D4 display says RECEIVING SYSEX DATA FROM MIDI. Note that loading sys ex data overwrites the resident memory.
5. The D4 will revert to whatever screen was showing prior to receiving MIDI data.

CHAPTER 5: EXTERNAL TRIGGERING

External triggering has three main uses:

- Driving D4 sounds from electronic drum pads. Some electronic drum pads provide MIDI triggers when hit; these can feed directly into the D4's MIDI input. Other pads generate analog triggers, which can interface with the trigger inputs.
- Using contact transducers (triggers) mounted on acoustic drums to trigger sounds from the D4. These transducers can be plugged directly into the D4 trigger input, which will convert the trigger's signal to MIDI information.
- Drum substitution. If the drum sounds on a tape are poorly recorded, and the sounds to be substituted are on different tracks (or sufficiently far apart in pitch that equalization can help separate the sounds), these drum sounds can trigger the high-fidelity drum sounds inside the D4.

All of these applications present certain challenges. With electronic drum pads, "crosstalk" from one drum hit can leak into another drum pad and trigger it accidentally. Acoustic drum pickups are much more finicky than electronic pads. They are subject to extraneous noise pickup, varying gain, and system noise, all of which make reliable triggering difficult.

The D4 includes five editable parameters that let you electronically tailor the D4 trigger inputs to the characteristics of your drum transducers. It may take considerable experimentation to achieve reliable triggering...then again, it may not. At some point, you'll hit on the right combination of transducer placement and D4 parameter values necessary for proper triggering.

The external trigger function contains six pages of parameters. When you first press the Ext Trig button, it calls up the first page. Pressing the Ext Trig button again calls the second page, a third time calls the third page, and so on. You can also use the cursor buttons to go from one page to another by "cursoring past" the parameters on the current screen. For more details, see sections 1.4B and 1.4C.

In the rest of this section, we'll assume you know how to select the appropriate page.

About Trigger Parameters

The D4 now offers five user controllable trigger parameters.
These are:

- **VCURVE.** This represents the velocity curve, or the sensitivity of the trigger input. There are eight separate curve tables, 0 through 7. Using these settings it is possible to adjust the D4's triggers to accompany a wide variety of playing styles, and to help compensate for sensitivity variances between different brands of drum pads and triggers.

The lower the setting, the less sensitive the velocity curve and the higher the setting, the more sensitive. For example, a pad using a setting of 7 will reach a MIDI velocity of 127 with just a moderate strike. For a pad whose VCURVE setting is 1, only a very hard hit would generate such a velocity.

For average type of play (striking pads with velocities ranging from very soft to very hard) the default setting of 4 is ideal in achieving the full range of sensitivity which corresponds to MIDI velocities of 1 through 127.

Note: Curve 0 is named "Unassigned". The function of this curve is explained fully in section 5.2 "Trigger Velocity Section".

- **XTALK.** (Crosstalk). Sometimes hitting one pad will cause a nearby pad to false trigger or "crosstalk". This is generally due to stand vibrations which can affect the other pads. These vibrations send signals to the nearby pads which can cause false triggering. The XTALK adjustment acts as a suppression control.

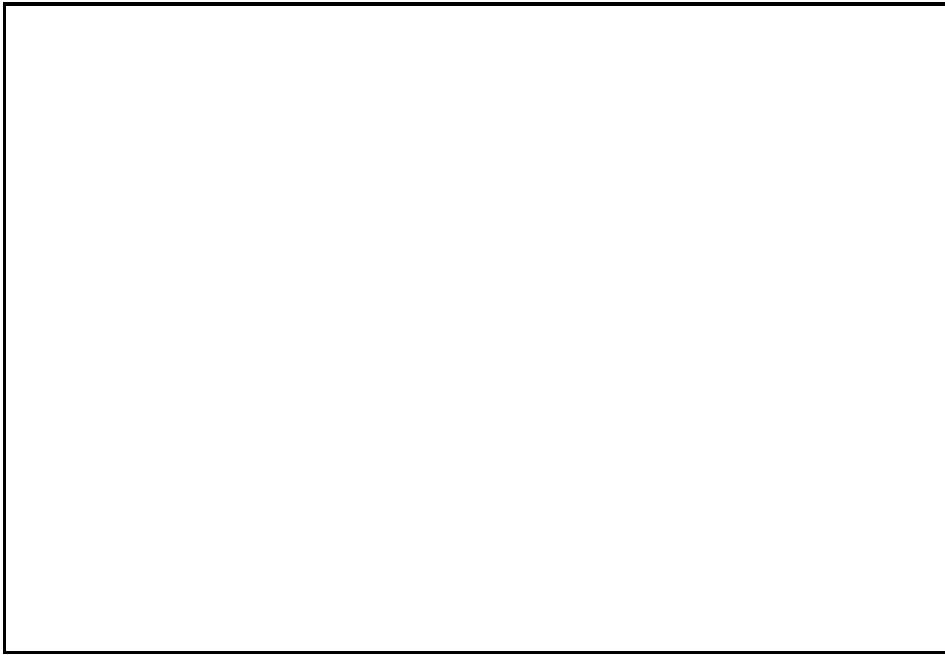
A higher value adjustment equals greater suppression of the signal, a lower value equals less suppression. Therefore, the higher the value setting, the less likely the nearby pad (or drum) will trigger from stand or head vibrations.

This is how it works:

First, you strike a pad and the D4 triggers its sound. Shortly after this hit the D4 receives a secondary, "softer" signal from a nearby pad. Before the D4 will play this softer signal, it will scan the other inputs to determine whether this was a legitimate hit, or simply a vibration from a stand or head.

It does this by comparing the level of this soft signal with the threshold level set in the XTALK parameter. If this secondary signal level is greater than the allowable threshold level, the D4 will trigger its sound. If the signal is less than the allowable threshold level, the D4 will ignore it.

By adjusting the crosstalk level to a higher value, you set a higher threshold for the signal to exceed, and reduce the ability of a pad (drum) to crosstalk. The following chart shows a scenario with a properly adjusted XTALK level.



This chart represents three signals which are "seen" by the D4. Signal 1 is a legitimate hit from the snare pad. Signal 2 is the Tom 1 pad, but it is not a hit. It is the pad being triggered by stand vibrations from the first snare hit. Signal 3 is a second "real" hit from the snare pad.

As you can see the XTALK threshold is set at a value of 30 (represented by the dotted line). The two snare hits (signals 1 and 3) both register well above the XTALK threshold. However, the tom (signal 2) registers too soft (at 20), and is correctly ignored by the D4.

If the XTALK level had been set at an improper value (in this case lower than 20), signal 2 would exceed the XTALK threshold, and the D4 would have triggered the sound. This illustrates how proper adjustment of the XTALK parameter will result in the elimination of this "interaction" between the pads.

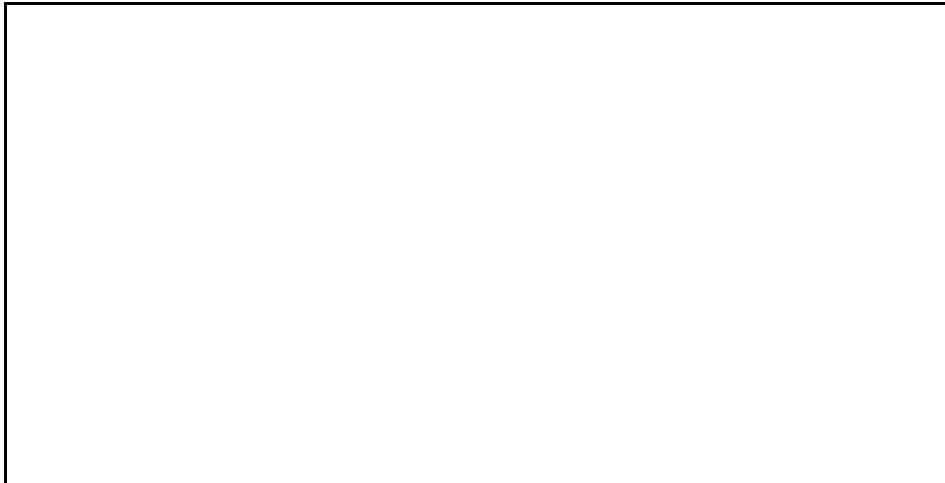
- **DCAY.** This parameter represents the signal decay time, or the amount of time between once a pad has been struck and triggers, to when it will trigger again from another hit. This is one of the more tricky issues of triggering. Here's why:

When hits are spaced 2 or more seconds apart, the first signal has plenty of time to decay completely, making it easy to determine the second signal as an actual hit. However, when playing quick, repetitive hits it is much more difficult to determine where one hit ends and the next one begins. To further complicate things, some drum sounds (especially acoustic drums) take a long time to decay. During this period, part of the decay can be interpreted as another closely-spaced hit.

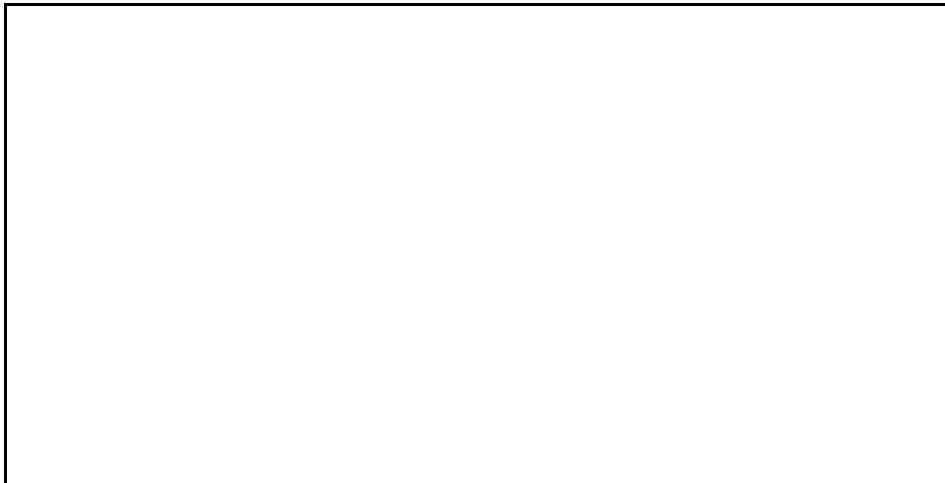
This is where the DCAY control comes in. The DCAY control adjusts the time and threshold of the signal decay making it possible for the D4 to correctly determine whether closely spaced signals are "real" hits or just decay.

Selecting a higher DCAY value (long decay times) will allow for the most reliable triggering but may miss quickly repeated hits. Lower DCAY values (shorter times) will respond to quickly repeated hits but may be more prone to false triggering. Experimentation with these levels is necessary to achieve the proper results.

Example:



This chart simulates the waveform of a snare drum hit. The first big point in the signal is the actual hit, the rest of the waveform is all decay. Since the DCAY time threshold is adjusted too low, the DCAY level curves off too soon allowing a second point, during the signal's decay, to exceed the threshold. Once this happens the D4 will trigger the sound.



On the other hand, this chart shows the same hit but with the DCAY parameter set at a higher value. Notice how the DCAY threshold is slightly higher and stays consistent for a longer time before it tapers off. Now only the initial strike of the drum triggers the D4.

- **NOISE.** The noise floor is the signal level threshold a vibration or sound must exceed before it can trigger a drum sound. When selecting lower values, very soft signals (hits) will trigger the D4. While this allows for the greatest sensitivity, there's a chance that unwanted, exterior signals such as vibrations from drum risers, bass cabinets, or even people jumping up and down on the dance floor may trigger a sound.

Higher settings are useful when trying to extract drum sounds from tape where other sounds are present; often the snare or kick drum will be louder than other sounds, so setting the threshold above the other sounds will allow the snare or kick to trigger the D4. However, the higher the threshold, the more likely that the instrument's full dynamic range won't be captured and some soft hits to the pad may not be recognized.

Note: The NOISE parameter in the D4 is similar to XTALK in that the level you set determines whether the trigger will fire on "softer" signals. But there is a difference. The NOISE parameter "looks" only at exterior causes of the signal, whereas the XTALK parameter "looks" at all of the other triggers in the D4 to determine whether the "soft" signal it is receiving is actually a "real hit".

- **GAIN.** This is the signal strength that the transducer is sending to the triggers in the D4. Its adjustment is very similar to that of a tape recorder's VU meter. With the gain set too low, soft hits may never be recognized. With the gain set too high, you may experience false, or double triggering. A properly adjusted gain setting will allow the highest dynamic range for the pad being used. The gain is the most important parameter in the D4. It must be correctly set for the remaining parameters to work properly, and to assure reliable triggering with the D4.

5.0 TRIGGER SELECTION

There are 12 input triggers with corresponding rear panel jacks. Each is edited independently, so it is first necessary to select a trigger input for editing.

Note: The MIDI note number default settings for the D4 triggers can be found in the D4 Factory Drumset Reference Chart.

Editable parameters are identical for all 12 triggers, and the trigger set up is global for all drum sets.

1. The first Ext Trig page shows three parameters, such as:

TRIG:01 VCURVE:4 NOTE: 046 A#1

As with the other screens, the cursor buttons move between the three parameters.

2. Place the cursor under the TRIG parameter.
3. Turn the Data wheel to select the desired trigger for editing.

5.1 TRIGGER NOTE SELECTION

Each trigger can be assigned to any MIDI note number, which is associated with a corresponding drum sound (programmed according to the instructions in section 3.0).

Trigger note assignments are recalled as part of a Drum Set whenever a new set is selected.

1. The first Ext Trig page shows three parameters. *Example:*

TRIG:02 VCURVE:4
NOTE: 036 C1

2. Place the cursor under the Note parameter.
3. Turn the Data wheel to select the note that will be assigned to the selected trigger input.

5.2 TRIGGER VELOCITY SELECTION

The velocity sensitivity of each trigger input can be adjusted to accompany a wide variety of playing styles, and to help compensate for sensitivity variances between various brands of drum pads and transducers.

For example, a hard hitting player might have a difficult time in playing the softer velocity sounds available in the D4 due to the high impact of most of his hits. Using a lower VCURVE setting (1 - 3) would require a much harder strike to generate a full MIDI velocity of 127, and make it much easier to obtain the more "subtle" velocity sounds when playing the drum pad. When using a higher VCURVE setting (5 - 7) the opposite applies, or a much softer hit would generate a MIDI velocity of 127.

1. While in the first Ext Trig page, place the cursor under the VCURVE parameter.
Example:

TRIG:02 VCURVE:4
NOTE: 036 C1

2. Turn the Data wheel to select the sensitivity value desired to suite the style of play, or the pads being used. The default setting of 4 is the "median" velocity curve. For average play (hits ranging from very soft to very hard) this curve gives you the full range of sensitivity which corresponds to MIDI velocities 1 through 127.

Note: The setting of 0, Unassigned, is selected by rotating the Data wheel fully counterclockwise. This is a special case VCURVE setting which allows a trigger input to contribute to the D4's master suppression threshold. However, it will not trigger any sounds or MIDI note messages. In certain circumstances this setting can help suppress false triggering on the other inputs.

Example: Suppose three drum pads are mounted on a single drum stand while set up on a noisy stage. Normally, a higher XTALK setting would be used to eliminate interaction between the pads, and a high NOISE floor setting would be selected to reject the high level of ambient noise and vibration. In certain cases with crosstalk and noise floor settings too high, softer hits might become rejected because the D4 assumes that they are noise.

Instead of compromising between the two parameters, there are two methods which can improve this scenario.

Method One:

1. First, attach an inexpensive contact transducer to the center of the drum stand and plug it into a D4 input.
2. Next, go to the VCURVE page under the EXT TRIG function and select the VCURVE setting of 0 (Unassigned) for this trigger.
3. Go to the next page and set the XTALK, DCAY and the NOISE levels all to 00. This low level will allow the maximum amount of noise and stand vibrations to be detected by the D4.
4. Press the EXT TRIG button again to get to the GAIN page showing the bar graph meter display. Using the meter, adjust the level to select a "hotter" than usual GAIN setting. Since in this case the gain is effected only by the stand vibrations, a very strong signal is needed to maximize the trigger's performance.
5. Now as the stage vibrates, or when other signals trigger the drum stand transducer, the suppression function will note this signal and determine that any softer signals coming from the other three pads must be crosstalk. Also, if the suppression function sees a soft signal from the three main pads but little or no signal from the drum stand transducer, it will assume that the pad signals are valid hits and trigger the D4 sounds.

Method Two:

In severe cases, this is another way in which the Unassigned feature can be used. For this scenario lets use the bass as the reason the surrounding noise level is making proper triggering difficult. Each time the bass player "pops" a string, the vibration triggers the tom 1 pad.

1. First, take a direct out from the bass amplifier, and plug it into an unused trigger input on the D4.
2. Next, go to the VCURVE page under the EXT TRIG function and select the VCURVE setting of 0 (Unassigned) for this trigger.

3. Go to the next page and set the XTALK, DCAY and NOISE levels all to 00. This low level will allow the maximum signal to be detected by the D4.
4. Press the EXT TRIG button again to get to the GAIN page. Using the bar graph meter, adjust the level according to the severity of the false triggering. If notes are constantly triggering, use a high gain. If only occasional, select a lower level.

Note: The peak level indicator (a period) explained in section 5.7 will not appear next to the value when in the Unassigned mode.

5. Now when the D4 receives a signal (from the tom 1 pad) which was generated by the string pop from the bass, not only will it compare this signal to the other drum pads, it will also compare it to the bass. In essence, the D4 isolates the bass from the noise floor and "thinks" the bass is another drum pad. It will now treat it the same as any other pad and "filter" out the unwanted signals.

Note: Note Chase will not follow any trigger that has been set to Unassigned. To view an Unassigned trigger's VU-style bar graph meter in order to adjust gain (section 5.7s), use the Data wheel to select the corresponding trigger input (section 5.0).

5.3 TRIGGER PARAMETER SELECTION

To compensate for differences in transducer outputs, the crosstalk, decay time, and noise floor level for each trigger can be set independently. These are Global settings that apply to all Drum Sets.

1. The second Ext Trig page shows four parameters. *Example:*

TRIG:02 XTALK:30 DCAY:10 NOISE:00

As with the other screens, the cursor buttons move between the three parameters.

5.4 TRIGGER CROSSTALK SELECTION

If several pads are mounted on one stand or rack it is possible to experience interaction or "crosstalk" problems. Adjustment of the XTALK parameter makes it possible to resolve these problems.

Note: In configurations where some pads are individually mounted, the default setting of 30 may be sufficient, making it unnecessary to adjust this parameter. In that case, skip this section and go on to 5.5 DCAY Control Selection.

1. After selecting the desired Trigger place the cursor under the XTALK parameter.
Example:

TRIG:03 XTALK:30 DCAY:10 NOISE:00

2. Turn the Data wheel to select the desired level of crosstalk suppression necessary to stop the problem pad from triggering. (00 is minimum, 99 maximum) This level will depend entirely on your current pad or drum configuration.

Remember: When experiencing an interaction problem, the trigger that needs adjustment is the pad that is false triggering, not the pad being struck. One easy way to remedy an interaction problem is to "silence" the pad(s) which are not "false triggering".

Example: Suppose you hit the snare pad and the tom 1 pad triggers.

1. First, go to the MIX page and reduce the volume of the snare pad to 00. Now when you hit the snare pad you won't hear it, but you will hear the tom 1 pad when it false triggers.
2. Next, press the EXT TRIG button twice (which gets you to the XTALK parameter page) and select the tom 1 trigger to edit.

3. Place the cursor under the XTALK parameter. While you hit the snare pad (triggering the tom pad) gradually raise the crosstalk level of the tom 1 pad.
4. Continue to raise the level until the tom pad stops triggering when you apply hard hits to the snare pad. By using this technique, you have isolated the problem drum, and made it easy to "dial in" the proper XTALK value without the sound from the other drum becoming distracting or confusing.
5. Finally, return to the MIX page and reset the volume of the snare pad to its original level.

Note: Always increase the XTALK value in small amounts for two reasons. The values are very sensitive, so an increase of as little as 2 or 3 can make a difference in suppression. Also, an unnecessarily high XTALK setting actually suppresses the sensitivity of the trigger input, resulting in the occasional loss of softer hits.

If a situation where a high XTALK setting is necessary to stop false triggering, but pad sensitivity loss is noticeable, try this combination. Start by slightly lowering the GAIN setting for the pad. This should make it possible to lower the XTALK value, which will allow the pad sensitivity to increase. With some experimentation and time, you should be able to find the right combination.

5.5 TRIGGER DCAY CONTROL SELECTION

If a pad or drum "double triggers" when it is struck, it may be necessary to adjust the DCAY level. This is evident when shortly after the initial strike to a pad, a second trigger from the same pad is generated, or it "double triggers".

Note: With certain pads it may not be necessary to adjust this parameter. In that case, skip this section and go on to 5.6 Noise Control Selection).

1. After selecting the desired Trigger whose decay level needs to be set, place the cursor under the DCAY parameter. *Example:*

TRIG:03 XTALK:30 DCAY: <u>10</u> NOISE:00
--

2. Turn the Data wheel to select the desired level of decay suppression necessary to stop the pad from double triggering. (00 is minimum, 99 maximum) This level will depend on your current set up, including the mounting configurations and the type of pads used.

When triggering from acoustic drums, the factors involved are staggering. Not only do the type and size of drum make a big difference, but things such as; if the drum is single or double headed, the tension of the head(s), the muffling, and the trigger placement all play very important roles in getting good results and proper "tracking" of your play. For more detailed tips and suggestions in these areas please refer to Tips On External Triggering From Acoustic Drums, included in the D4 literature package.

5.6 TRIGGER NOISE LEVEL SELECTION

When in a high noise floor level situation such as playing live on a stage with bass cabinets nearby, it may be necessary to adjust the NOISE parameter level. If your situation does not necessitate the need to make these type of adjustments, skip this section and go on to 5.7 Trigger Gain Selection.

1. After selecting the desired Trigger whose noise level needs to be set, place the cursor under the NOISE parameter. *Example:*

TRIG:03 XTALK:30 DCAY:10 NOISE: <u>00</u>
--

2. Turn the Data wheel to select the desired level of suppression necessary to stop the pad from false triggering. (00 is minimum, 99 maximum) Stage noise and rumble, the stability of drum risers and platforms, volume, and crowd vibrations are all factors in choosing the proper level.

Remember: In keeping potential problems to a minimum, it is always a good idea to try to keep some distance between your pad or drum kit, and nearby speaker cabinets (especially bass cabinets). Whenever possible, try to aim them so they are not facing directly towards your set up. Also, avoid unsteady drum risers and hardware.

5.7 TRIGGER GAIN SELECTION

To compensate for differences in transducer outputs, the gain for each trigger can be set independently.

1. The third Ext Trig page shows two parameters. *Example:*

TRIG:01 GAIN:50

As with the other screens, the cursor buttons move between the two parameters. The Trig parameter is identical to the one on the first two Ext Trig pages, and allows you to select different Trigger inputs for editing.

2. After selecting the desired Trigger whose gain needs to be set, place the cursor under the GAIN parameter.
3. Turn the Data wheel to select the desired amount of gain (00 is minimum gain, 99 maximum gain).

4. To aid in the adjustment of this parameter, strike the pad or drum whose transducer is plugged into the selected input. The lower LCD line will turn into a bar-graph meter that shows the peak strength of the transducer signal. Adjust the gain so that a powerful strike results in the meter reaching the right-most side of the display, and a period appears to the right of the GAIN number. This period indicates that the input is reaching its full dynamic range. When a trigger's gain is properly adjusted, the period will appear only on the strongest hits.

5.8 FOOTSWITCH MODE

There are two footswitch options, **Hi Hat Pedal** (which lets a footswitch act like a hi hat pedal) and **Drumset Advance** (pressing the footswitch increments the Drum Set to the next higher number; past 20, it wraps around to 00 again).

You can use either a normally closed or normally open momentary contact footswitch. Plug it in to the rear panel footswitch jack before powering up the D4; on power up, it will automatically sense the footswitch polarity and calibrate itself accordingly. If your footswitch seems to respond “backwards,” turn off the D4, make sure the footswitch plug is fully inserted into the footswitch jack, then turn power back on.

1. Select the fourth Trigger page, which shows:

FOOTSWITCH MODE:
HI HAT PEDAL

2. Use the Data wheel to select the desired footswitch function.
3. When Hi Hat Pedal mode is selected, the External Trigger has two more pages. The fifth Trigger page shows the MIDI note number that the footswitch will trigger when it is pressed.
4. The sixth Trigger page shows the MIDI note number that Trigger Input #1 will play when that pad is hit while the footswitch is held closed.

5.8A Understanding Hi Hat Pedal Mode

This is a feature for hardcore drummers. It's a little complicated, but hang in there—the D4 finally gives you a way to get truly realistic hi hat effects with electronic drums.

An acoustic hi hat produces three main types of sound:

- Open hi hat. The pedal is up so that the upper and lower cymbals do not touch. Striking the upper cymbal causes it to ring until it is struck again, or until the pedal begins closing.
- Foot closed hi hat. This is the sound generated by pushing down on the pedal; it is not initiated by hitting the hi hat with a drum stick, but by the sound of the upper cymbal striking the lower one.
- Closed hi hat. Once the hats are closed (pedal down), then striking the upper cymbal with the drumstick produces the closed hi hat sound.

To replicate these individual effects:

1. Patch a drum pad (the “hi hat” striking surface) into D4 Trigger input 1 and a footswitch (for “opening” and “closing” the hi hat) into the footswitch input. Hi Hat Pedal must be selected for the footswitch mode.
2. If it isn't assigned already, assign an open hi hat sound to the note triggered by Trigger Input 1.
3. Press the EXTERNAL TRIG button until the display shows the Footswitch Closing note. This is the note that will be played when the footswitch is pressed. If it hasn't been assigned already, assign a closing hi hat sound to this note. This will give the hi hat a realistic closing sound, as opposed to an abrupt switch from an open sound to a closed sound.

Note that you don't necessarily *have* to use hi hat sounds while using this mode. If you wish, you can use any sound available in the D4.

4. Press the EXTERNAL TRIG button until the display shows the Footswitch Held note. This is the note that will be played when Trigger 1 is struck AND the footswitch is held. If it hasn't been assigned already, assign a closed hi hat sound to this note.
5. Using the Group function (section 3.7), assign all the hi hat sounds to Group 1 so that you can't have two different hi hat sounds ringing at the same time. (The hi hat sounds could be assigned to Group 2 if you're already using Group 1 for other drum sounds.)

If you strike the hi hat pad while the footswitch is not pressed, you'll hear the open hi hat sound. Pressing the footswitch triggers the foot closed sound (at the same velocity as the most recent open hi hat hit); just like a real hi hat, you don't have to strike the pad—simply “closing” the hi hat by pressing the footswitch triggers the sound.

Striking the pad while the footswitch is held down plays the closed hi hat sound.

CHAPTER 6: MIDI SUPPLEMENT

(This chapter is an abridged version of material from *Power Sequencing with Master Tracks Pro/Pro 4* and *The Complete Guide to the Alesis HR-16 and MMT-8*, copyright 1990 and 1989 respectively by AMSCO Publications, and is adapted with permission.)

6.0 MIDI BASICS

Most current electronic instruments and signal processors, including the D4, contain an internal computer. Computers and music have been working together for decades, which is not surprising considering music's mathematical basis (consider frequencies, harmonics, vibrato rates, tunings, etc.). In the mid-70s, microcomputers became inexpensive enough to be built into consumer-priced musical instruments. They were used for everything from sound generation to storing parameters in memory for later recall.

In 1983, the MIDI (Musical Instrument Digital Interface) specification was introduced to better exploit the computers inside these new musical instruments, primarily to insure compatibility with equipment from other manufacturers. MIDI expresses musical events (notes played, vibrato, dynamics, tempo, etc.) as a common "language" consisting of standardized digital data. This data can be understood by MIDI-compatible computers and computer-based musical instruments.

Before electronics, music was expressed exclusively as written symbols. By translating musical parameters into digital data, MIDI can express not only the types of musical events written into sheet music, but other parameters as well (such as amount of pitch bend or degree of vibrato).

6.1 MIDI HARDWARE

MIDI-compatible devices usually include both MIDI In and MIDI Out jacks, which terminate in 5-pin DIN-style connectors. The MIDI Out jack transmits MIDI data to another MIDI device. As you play a MIDI controller such as a keyboard, data corresponding to what you play exits the MIDI Out jack. *Example:* If you play middle C, the MIDI Out transmits a piece of data that says "middle C is down." If you release that key, the MIDI Out transmits another piece of data that says "middle C has been released."

If the keyboard responds to the dynamics of your playing, the note data will include dynamics information too. Moving the modulation wheels and pedals attached to many synthesizers will also generate data associated with the wheel or pedal being used.

The MIDI In jack receives data from another MIDI device. In addition to the type of performance data described above, rhythmically-oriented MIDI devices (e.g., drum

machines) can often transmit and/or receive additional MIDI timing messages that keep other rhythmically-oriented units in a system synchronized with each other.

An optional MIDI Thru jack provides a duplicate of the signal at the MIDI In jack. This is handy if you want to route MIDI data appearing at one device to another device as well. Some devices, like the D4, switch their MIDI Out between the Out and Thru functions.

Example: Suppose a keyboard's MIDI Out feeds the D4's MIDI In. If the D4's MIDI Out is set to function as a Thru jack, you could patch it to the input of an MMT-8 sequencer. Thus, the keyboard would control the D4 and be able to record data into the sequencer. Note that any notes generated by the D4 would be recorded into the sequencer as well.

6.2 MIDI MESSAGE BASICS

The are two main types of MIDI messages. *Channel* messages, which are channel-specific, consist of Voice and Mode messages. *System* messages, which do not have a channel number and are received by all units in a system, include Common, Real Time, and Exclusive messages.

6.3 CHANNEL MESSAGES

6.3A Voice Messages

A synthesizer's voice is the most basic unit of sound generation. Usually, each voice plays one note at a time, so the number of notes you can play at one time will be limited by the available number of voices. MIDI messages that affect voices include:

Note On Corresponds to a key being pressed down; values range from 000 (lowest note) to 127 (highest note). Middle C is 60.

Note Off Corresponds to a key being released; values are the same as note on.

Velocity Corresponds to dynamics; values range from 001 (minimum velocity) to 127 (maximum velocity). A velocity of 000 is equivalent to a note-off message.

Pressure Indicates the pressure applied to a keyboard after pressing a key.

Program Change Sending a Program Change command from a sequencer or other MIDI keyboard can change synth patches automatically. There are 128 Program Change command numbers.

Also note that not all units number programs consistently. Some number them as 000-127, others as 001-128, and still others arrange programs in banks of 8 programs (such as A1-A8, B1-B8, C1-C8, etc.).

Pitch Bend This “bends” a note from its standard pitch.

Continuous Controller Footpedals, breath controllers, and modulation wheels can vary sounds as you play, thus adding expressiveness. MIDI allows for 64 continuous controllers (these act like potentiometers in that you can choose one of many different values) and 58 continuous/switch controllers (these can act like continuous controllers but some are assumed to choose between two possible states, such as on/off).

Each type of controller is stamped with its own controller identification number. Not all controller numbers have been standardized for specific functions, but the following indicates the current list of assigned controllers. Numbers in parenthesis indicate the controller range.

- 0 Bank Select (0-127)
- 1 Modulation Wheel (0-127)
- 2 Breath Controller (0-127)
- 3 Early DX7 Aftertouch (0-127)
- 4 Foot Controller (0-127)
- 5 Portamento Time (0-127)
- 6 Data Slider (0-127)
- 7 Main Volume (0-127)
- 8 Balance (0-127)
- 10 Pan (0-127)
- 11 Expression (0-127)
- 16 General Purpose #1 (0-127)
- 17 General Purpose #2 (0-127)
- 18 General Purpose #3 (0-127)
- 19 General Purpose #4 (0-127)
- 32-63 Least Significant Bits, Controllers 0-31 (0-127)
- 64 Sustain Pedal (0 or 127)
- 65 Portamento On/Off (0 or 127)
- 66 Sostenuto Pedal (0 or 127)
- 67 Soft Pedal (0 or 127)
- 69 Hold 2 (0 or 127)
- 80 General Purpose #5 (0 or 127)
- 81 General Purpose #6 (0 or 127)
- 82 General Purpose #7 (0 or 127)
- 83 General Purpose #8 (0 or 127)
- 92 Tremolo Depth (0-127)
- 93 Chorus Depth (0-127)
- 94 Celeste Depth (0-127)
- 95 Phase Depth (0-127)
- 96 Data Increment (0 or 127)
- 97 Data Decrement (0 or 127)
- 98 Non-Registered Parameter MSB (0-127)
- 99 Non-Registered Parameter LSB (0-127)
- 100 Registered Parameter MSB (0-127)
- 101 Registered Parameter LSB (0-127)
- 121 Reset All Controllers (0)
- 122 Local Control On/Off (0 or 127)
- 123 All Notes Off (0)

- 124 Omni Off (0)
- 125 Omni On (0)
- 126 Mono On (0-16; 0=Omni Off)
- 127 Poly On (0)

6.3B Mode Messages

There are two messages that determine the MIDI mode (*i.e.*, how the D4 will receive MIDI data). The “Omni” message determines how many channels will be recognized. Omni On means that data from all channels will be received; Omni Off limits the number of channels, usually to one.

The “Mono/Poly” message deals with voice assignment within the synthesizer. In Mono mode, only one note at a time plays in response to voice messages; in Poly mode, as many voices can play notes as are available to play notes.

The D4 implements two different MIDI modes.

Omni On/Poly (Mode 1) The D4 responds to MIDI data occurring on any channel.

Omni Off/Poly (Mode 3) The D4 is tuned to a single MIDI channel, from 1 to 16.

6.4 SYSTEM COMMON MESSAGES

Intended for all units in a system, some of these messages are:

Song Position Pointer This indicates how many “MIDI beats” (normally a 16th note) have elapsed since a piece started (up to 16,384 total beats). It is primarily used to allow different sequencers and drum machines to auto-locate to each other so that if you start one sequencer, the other device will automatically jump to the same place in the song, whereupon both continue on together.

System Exclusive This message (called sys ex for short) is considered “exclusive” because different manufacturers send and receive data over MIDI which is intended only for that manufacturer’s equipment. *Example:* Sending a D4 message to an Ensoniq SD-1 won’t do anything but the message will be understood by other D4s. This data often contains information about individual instrument programs.

Timing Clock A master tempo source (such as a sequencer) emits 24 timing messages (clocks) per quarter note. Each device synchronized to the sequencer advances by 1/24th of a quarter note when it receives the clock message, thus keeping units in sync after they’ve both started at the same time. Many devices subdivide this clock signal internally for higher resolution (*e.g.*, 96 pulses per quarter note).

Start Signals all rhythmically-based units when to start playing.

Stop Signals all rhythmically-based units when to stop playing.

Continue Unlike a Start command, which re-starts a sequencer or drum machine from the beginning of a song each time it occurs, sending a continue message after stop will re-start units from where they were stopped.

6.5 BOOKS ON MIDI

The preceding does not substitute for reading a good book on the subject of MIDI. For further information, refer to the following:

MIDI For Musicians and *The Electronic Musician's Dictionary* by Craig Anderton; AMSCO Publications. The former was written specifically for musicians with no background in MIDI, and the latter defines terms related to musical electronics.

Music Through MIDI by Michael Boom; Microsoft Press. An excellent text for those just getting started with MIDI, synthesis, and related topics.

The Murphy's Law MIDI Book by Jeff Burger; Alexander Publishing. Emphasizes applications and problem-solving.

Using MIDI by Helen Casabona and David Frederick; Alfred Publishing. A general guide to MIDI with an emphasis on applications.

Understanding MIDI and *Understanding MIDI 2* by various authors; Amordian Press. A collection of MIDI-oriented articles from *Musician* magazine.

Descubriendo MIDI by José Valenzuela; Alesis Publishing. A thorough overview of MIDI in Spanish, suitable for beginners and/or advanced users.

6.6 VIDEOS ON MIDI

The Basics Of MIDI featuring Craig Anderton with Steve Smythe; Alesis Publishing. An overview of the concepts and applications of the MIDI interface. Available through Alesis Command Performance Accessory Collection.